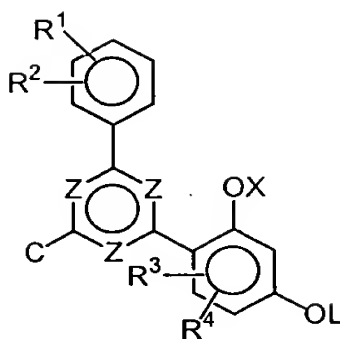


## The Claims

What is claimed is:

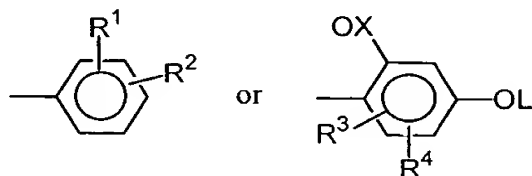
1. A compound of formula II



- 5 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is either



- 10 each of L is independently a

hydrogen, hydrocarbyl,  $-\text{SO}_2(\text{hydrocarbyl})$ ,  $-\text{SO}_3(\text{hydrocarbyl})$ ,  $-\text{SO}_2(\text{functional hydrocarbyl})$ ,  $-\text{SO}_3(\text{functional hydrocarbyl})$ ,  $-\text{COO}(\text{hydrocarbyl})$ ,  $-\text{COO}(\text{functional hydrocarbyl})$ ,  $-\text{CO}(\text{hydrocarbyl})$ ,  $-\text{CO}(\text{functional hydrocarbyl})$ ,  $-\text{OCO}(\text{hydrocarbyl})$ ,  $-\text{OCO}(\text{functional hydrocarbyl})$ ,  $-\text{CONH}_2$ ,  $-\text{CONH}(\text{hydrocarbyl})$ ,  $-\text{CONH}(\text{functional hydrocarbyl})$ ,  $-\text{CON}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ , or a hydrocarbyl group substituted by any of the above groups;

15

each of R<sup>3</sup> and R<sup>4</sup> are independently a

hydrogen, hydrocarbyl, halogen, hydroxyl, cyano, -O(hydrocarbyl), -O(functional hydrocarbyl), -N(hydrocarbyl)(hydrocarbyl), -N(hydrocarbyl)(functional hydrocarbyl), -N(functional hydrocarbyl)(functional hydrocarbyl),  
5 -S(hydrocarbyl), -S(functional hydrocarbyl), -SO<sub>2</sub>(hydrocarbyl),  
-SO<sub>3</sub>(hydrocarbyl), -SO<sub>2</sub>(functional hydrocarbyl), -SO<sub>3</sub>(functional hydrocarbyl),  
-COO(hydrocarbyl), -COO(functional hydrocarbyl), -CO(hydrocarbyl),  
-CO(functional hydrocarbyl), -OCO(hydrocarbyl), -OCO(functional hydrocarbyl),  
10 -CONH<sub>2</sub>, -CONH(hydrocarbyl), -CONH(functional hydrocarbyl),  
-CON(hydrocarbyl)(hydrocarbyl), -CON(functional hydrocarbyl)(hydrocarbyl),  
-CON(functional hydrocarbyl)(functional hydrocarbyl), or a hydrocarbyl group substituted by any of the above groups; and

each R<sup>1</sup> and R<sup>2</sup> is identical or different and is independently a hydrocarbyl group of between 1 and 20 carbons, wherein R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene  
15 ring so that they are ortho to each other.

2. A compound of claim 1, wherein L is selected from the group consisting of:

hydrogen;

an alkyl of 1 to 24 carbon atoms optionally substituted by one or more hydroxyl,

20 alkoxy, carboxy, carboalkoxy, amino, amido, carbamato, or epoxy groups,  
and which may contain one or more carbonyl groups, oxygen atoms or nitrogen atoms in the chain;

an alkenyl of 2 to 24 carbon atoms optionally substituted by hydroxyl, alkoxy,

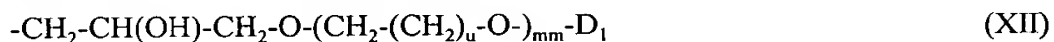
25 carboxy, carboalkoxy, amino, amido, carbamato, or epoxy groups and which may contain one or more carbonyl groups, oxygen atoms or nitrogen atoms in the chain or attached to the chain;

a cycloalkyl of 5 to 24 carbon atoms optionally substituted by hydroxyl, carboxyl, or amino groups and optionally containing carbonyl, oxygen, or nitrogen in the ring;

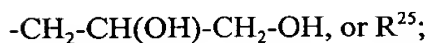
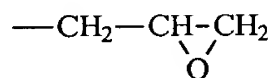
30 an aralkyl of 7 to 24 carbon atoms optionally substituted by one or more hydroxyl, alkoxy, chloro, cyano, carboxy, carboalkoxy, amino, amido, carbamato, or epoxy

groups and may contain one or more carbonyl groups, oxygen atoms or nitrogen atoms in the ring;

a polyoxyalkylene radical of the formula XII



5 wherein  $\text{D}_1$  is hydrogen,

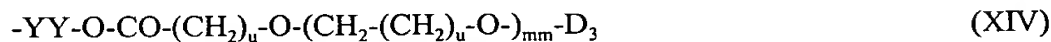


a polyoxyalkylene radical of the formula XIII



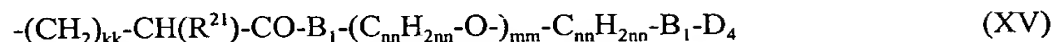
wherein  $\text{D}_2$  is  $-(\text{CH}_2)_u-\text{CO}-\text{R}^{22}$  or  $\text{R}^{25}$ ;

10 a polyoxyalkylene radical of the formula XIV



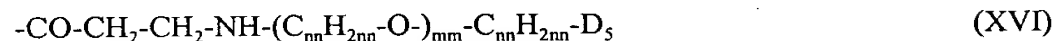
wherein  $\text{D}_3$  is  $-(\text{CH}_2)_u-\text{CO}-\text{R}^{22}$  or  $\text{R}^{25}$ ;

a polyoxyalkylene radical of the formula XV



15 wherein  $\text{D}_4$  is hydrogen or  $\text{R}^{25}$ ;

a polyoxyalkylene radical of the formula XVI



wherein  $\text{D}_5$  is  $-\text{NH}_2$ ,  $-\text{NH}-(\text{CH}_2)_2-\text{COO}-\text{R}^{23}$  or  $-\text{O}-\text{R}^{25}$ ;

a polyoxyalkylene radical of the formula XVII



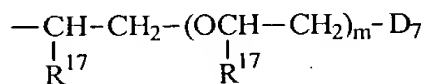
wherein  $\text{D}_5$  is as defined under formula (XVI);

a polyoxyalkylene radical of the formula XVIII



wherein  $\text{D}_6$  is  $-\text{NH}-\text{CO}-\text{R}^{24}$ ,  $-\text{OR}^{25}$ ,  $\text{OH}$  or  $\text{H}$ ;

25 a polyoxyalkylene radical of the formula XIX



(XIX)

wherein  $D_7$  is  $-OR^{25}$ ,  $-NHCOR^{24}$  or  $-OCH_2CH_2OR^{25}$ ;

$R^{21}$  is hydrogen or  $C_1-C_{16}$  alkyl;

$R^{17}$  is  $C_2-C_{10}$  alkylene, phenylene, naphthylene, diphenylene, or  $C_2-C_6$  alkenylene,

5 methylenediphenylene, or  $C_4-C_{15}$  alkylphenylene;

$R^{21}$  is hydrogen or  $C_1-C_{16}$  alkyl;

$R^{22}$  is halogen or  $-O-R^{23}$ ;

$R^{23}$  is hydrogen,  $C_1-C_6$  alkyl,  $C_3-C_6$  alkenyl, aryl, or

aryl- $C_1-C_4$ -alkyl;

10  $R^{24}$  is hydrogen,  $C_1-C_{12}$  alkyl or aryl;

$R^{25}$  is  $C_1-C_{16}$  alkyl,  $C_5-C_{12}$  cycloalkyl,  $C_3-C_6$  alkenyl,

$C_1-C_{12}$  alkylaryl or aryl- $C_1-C_4$  alkyl;

YY is unsubstituted or substituted  $C_2-C_{20}$  alkyl;

$B_1$  is HN or O;

15 kk is zero or an integer from 1-16;

mm is an integer from 2 to 60;

nn is an integer from 2 to 6;

u is an integer from 1 to 4.

20 3. The compound of claim 1, wherein L is alkyl chain of between 1 and 20 carbons optionally interrupted by one or more oxygen atoms, having one or more of the hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminating with a carbonyl functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$ ,  $NR^xR^y$  wherein  $R^x$  and  $R^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally have one or more of the  
25 hydrogens substituted for by a hydroxyl group.

4. The compound of claim 1, wherein  $R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with the nitrogen of an amine.

30

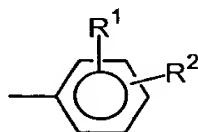
5. The compound of claim 1, wherein each  $R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl.

6. The compound of claim 5, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 3 and 4 position relative to the point of attachment of the triazine ring.

7. The compound of claim 5, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 2 and 3 position relative to the point of attachment of the triazine ring.

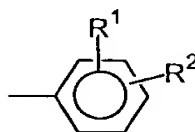
10 8. The compound of claim 1, wherein each Z is a nitrogen

9. The compound of claim 8, wherein C is



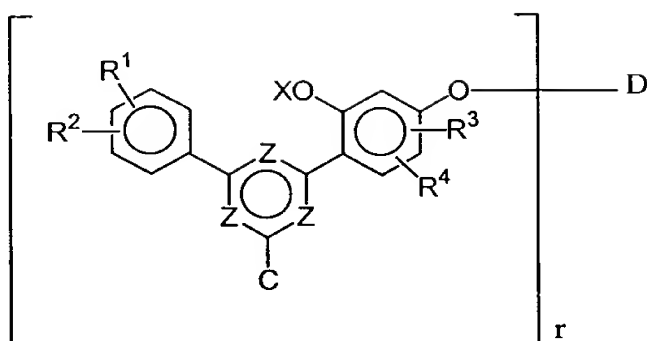
10. The compound of claim 9, wherein each  $R^1$  and  $R^2$  are methyl groups.

15 11. The compound of claim 1, wherein each Z is nitrogen X is hydrogen; C is



each  $R_1$  and  $R_2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl; L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $-CO-M$ , wherein  
20 M is a  $OR^x$ ,  $NR^xR^y$  wherein  $R^x$  and  $R^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally has one or more of the hydrogens substituted for by a hydroxyl group; and  $R^3$  and  $R^4$  are each hydrogen.

12. A compound of formula (III):

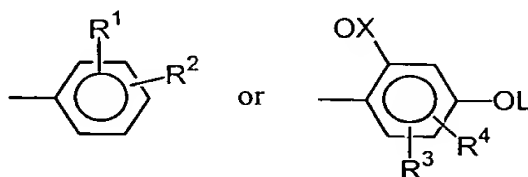


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to produce a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

5 C is either



r is an integer between 2 and 4;

each of L is independently a

hydrogen, hydrocarbyl,  $-\text{SO}_2(\text{hydrocarbyl})$ ,  $-\text{SO}_3(\text{hydrocarbyl})$ ,  $-\text{SO}_2(\text{functional hydrocarbyl})$ ,  $-\text{SO}_3(\text{functional hydrocarbyl})$ ,  $-\text{COO}(\text{hydrocarbyl})$ ,  $-\text{COO}(\text{functional hydrocarbyl})$ ,  $-\text{CO}(\text{hydrocarbyl})$ ,  $-\text{CO}(\text{functional hydrocarbyl})$ ,  $-\text{OCO}(\text{hydrocarbyl})$ ,  $-\text{OCO}(\text{functional hydrocarbyl})$ ,  $-\text{CONH}_2$ ,  $-\text{CONH}(\text{hydrocarbyl})$ ,  $-\text{CONH}(\text{functional hydrocarbyl})$ ,  $-\text{CON}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ , or a hydrocarbyl group substituted by any of the above groups;

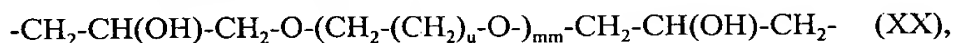
each of  $\text{R}^3$  and  $\text{R}^4$  are independently a

hydrogen, hydrocarbyl, halogen, hydroxyl, cyano, -O(hydrocarbyl), -O(functional hydrocarbyl), -N(hydrocarbyl)(hydrocarbyl), -N(hydrocarbyl)(functional hydrocarbyl), -N(functional hydrocarbyl)(functional hydrocarbyl), -S(hydrocarbyl), -S(functional hydrocarbyl), -SO<sub>2</sub>(hydrocarbyl), -SO<sub>3</sub>(hydrocarbyl), -SO<sub>2</sub>(functional hydrocarbyl), -SO<sub>3</sub>(functional hydrocarbyl), -COO(hydrocarbyl), -COO(functional hydrocarbyl), -CO(hydrocarbyl), -CO(functional hydrocarbyl), -OCO(hydrocarbyl), -OCO(functional hydrocarbyl), -CONH<sub>2</sub>, -CONH(hydrocarbyl), -CONH(functional hydrocarbyl), -CON(hydrocarbyl)(hydrocarbyl), -CON(functional hydrocarbyl)(hydrocarbyl), -CON(functional hydrocarbyl)(functional hydrocarbyl), or a hydrocarbyl group substituted by any of the above groups;

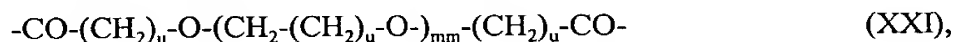
each R<sup>1</sup> and R<sup>2</sup> is identical or different and is independently a hydrocarbyl group of between 1 and 20 carbons, wherein R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

D, when r is 2, is selected from the group consisting of C<sub>1</sub>-C<sub>16</sub> alkylene, C<sub>4</sub>-C<sub>12</sub> alkenylene, xylylene, C<sub>4</sub>-C<sub>20</sub> alkylene which is interrupted by one or more oxygen atoms, hydroxy-substituted C<sub>3</sub>-C<sub>20</sub> alkyl which is interrupted by one or more oxygen atoms, -CH<sub>2</sub>CH(OH)CH<sub>2</sub>O-R<sup>15</sup>-OCH<sub>2</sub>CH(OH)CH<sub>2</sub>-, -CO-R<sup>16</sup>-CO-, -CO-NH-R<sup>17</sup>-NH-CO-, -(CH<sub>2</sub>)<sub>s</sub>-COO-R<sup>18</sup>-OCO-(CH<sub>2</sub>)<sub>s</sub>-

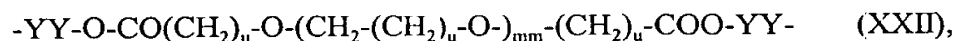
a polyoxyalkylene bridge member of the formula XX



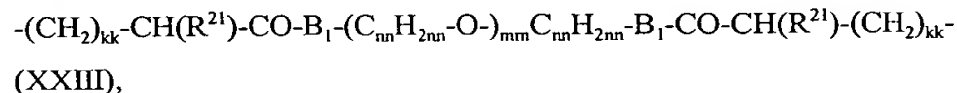
a polyoxyalkylene bridge member of the formula XXI



a polyoxyalkylene bridge member of the formula XXII



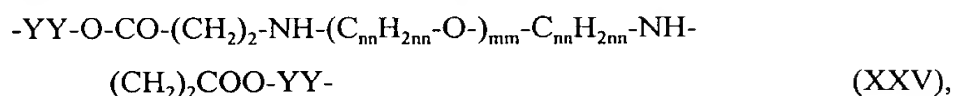
a polyoxyalkylene bridge member of the formula XXIII



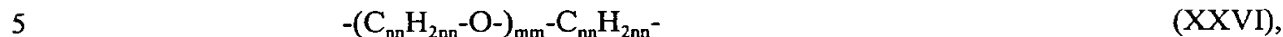
a polyoxyalkylene bridge member of the formula XXIV



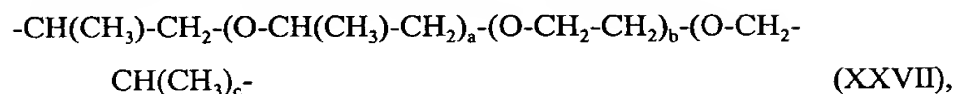
a polyoxyalkylene bridge member of the formula XXV



a polyoxyalkylene bridge member of the formula XXVI



and a polyoxyalkylene bridge member of the formula XXVII



wherein  $a + c = 2.5$  and  $b = 8.5$  to  $40.5$  or  $a + c = 2$  to  $33$  and  $b = 0$ ,

10  $R^{15}$  is  $C_2-C_{10}$  alkylene,  $C_2-C_{10}$  oxaalkylene or  $C_2-C_{10}$  dithiaalkylene, phenylene, naphthylene, diphenylene, or  $C_2-C_6$  alkenylene, or phenylene-XX-phenylene wherein XX is  $-O-$ ,  $-S-$ ,  $-SO_2-$ ,  $-CH_2-$ , or  $-C(CH_3)_2-$ ;

15  $R^{16}$  is  $C_2-C_{10}$  alkylene,  $C_2-C_{10}$  oxaalkylene or  $C_2-C_{10}$  dithiaalkylene, phenylene, naphthylene, diphenylene, or  $C_2-C_6$  alkenylene provided that when  $r$  is 3 the alkenylene has at least 3 carbons;

$R^{17}$  is  $C_2-C_{10}$  alkylene, phenylene, naphthylene, diphenylene, or  $C_2-C_6$  alkenylene, methylenediphenylene, or  $C_4-C_{15}$  alkylphenylene; and

20  $R^{18}$  is  $C_2-C_{10}$  alkylene, or  $C_4-C_{20}$  alkylene interrupted by one or more oxygen atoms;

$R^{21}$  is hydrogen or  $C_1-C_{16}$  alkyl;

YY is unsubstituted or substituted  $C_2-C_{20}$  alkyl;

$B_1$  is NH or O;

25  $kk$  is zero or an integer from 1-16;

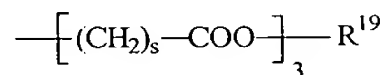
$mm$  is an integer from 2 to 60;

$nn$  is an integer from 2 to 6;

$s$  is 1-6;

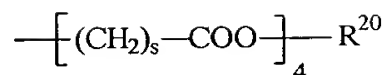
$u$  is an integer from 1 to 4;

30 when  $r$  is 3, D is



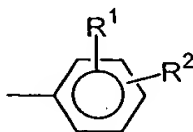


and when r is 4, D is



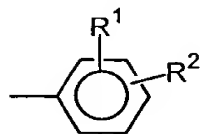
wherein  $\text{R}^{19}$  is  $\text{C}_3\text{-C}_{10}$  alkanetriyl and  $\text{R}^{20}$  is  $\text{C}_4\text{-C}_{10}$  alkanetetryl.

13. The compound of claim 12, wherein r is 2 and D is an alkyl chain of between 1 and 10 carbons or  $-\text{CO-P-CO}-$ , wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other.
14. The compound of claim 13, wherein  $\text{R}^3$  and  $\text{R}^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with the nitrogen of an amine.
15. The compound of claim 13, wherein  $\text{R}^1$  and  $\text{R}^2$  is individually a  $\text{C}_1$  to  $\text{C}_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl.
- 15 16. The compound of claim 15, wherein  $\text{R}^1$  and  $\text{R}^2$  are attached to the aromatic benzene ring at the 3 and 4 position relative to the point of attachment of the triazine ring.
17. The compound of claim 15, wherein  $\text{R}^1$  and  $\text{R}^2$  are attached to the aromatic benzene ring at the 2 and 3 position relative to the point of attachment of the triazine ring.
- 20
18. The compound of claim 13, wherein each Z is a nitrogen
19. The compound of claim 13, wherein C is



20. The compound of claim 19, wherein each R<sup>1</sup> and R<sup>2</sup> are methyl groups.

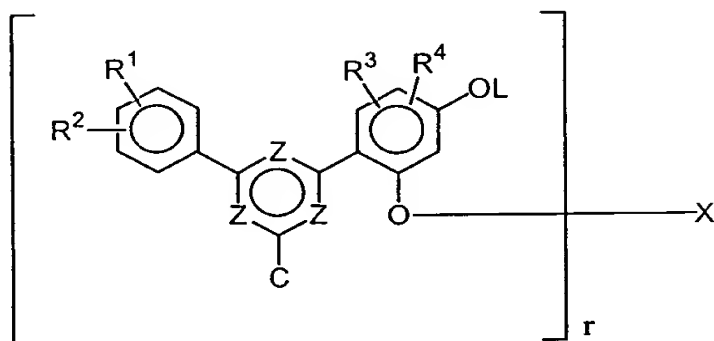
21. The compound of claim 13, wherein each Z is nitrogen; X is hydrogen; C is



each R<sub>1</sub> and R<sub>2</sub> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl; and

5 R<sup>3</sup> and R<sup>4</sup> are each hydrogen.

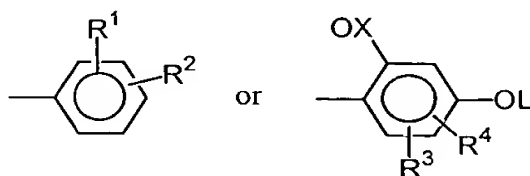
21. A compound of formula (IV):



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to produce a triazine or pyrimidine ring;

10 C is either



wherein X is selected from hydrogen and a blocking group;

r is an integer between 2 and 4;

each of L is independently a

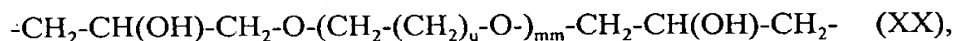
hydrogen, hydrocarbyl,  $-\text{SO}_2(\text{hydrocarbyl})$ ,  $-\text{SO}_3(\text{hydrocarbyl})$ ,  $-\text{SO}_2(\text{functional hydrocarbyl})$ ,  $-\text{SO}_3(\text{functional hydrocarbyl})$ ,  $-\text{COO}(\text{hydrocarbyl})$ ,  $-\text{COO}(\text{functional hydrocarbyl})$ ,  $-\text{CO}(\text{hydrocarbyl})$ ,  $-\text{CO}(\text{functional hydrocarbyl})$ ,  $-\text{OCO}(\text{hydrocarbyl})$ ,  $-\text{OCO}(\text{functional hydrocarbyl})$ ,  $-\text{CONH}_2$ ,  $-\text{CONH}(\text{hydrocarbyl})$ ,  $-\text{CONH}(\text{functional hydrocarbyl})$ ,  $-\text{CON}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ , or a hydrocarbyl group substituted by any of the above groups;

each of  $\text{R}^3$  and  $\text{R}^4$  are independently a

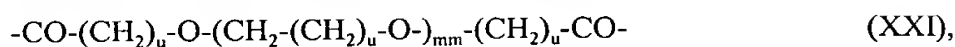
hydrogen, hydrocarbyl, halogen, hydroxyl, cyano,  $-\text{O}(\text{hydrocarbyl})$ ,  $-\text{O}(\text{functional hydrocarbyl})$ ,  $-\text{N}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{N}(\text{hydrocarbyl})(\text{functional hydrocarbyl})$ ,  $-\text{N}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ ,  $-\text{S}(\text{hydrocarbyl})$ ,  $-\text{S}(\text{functional hydrocarbyl})$ ,  $-\text{SO}_2(\text{hydrocarbyl})$ ,  $-\text{SO}_3(\text{hydrocarbyl})$ ,  $-\text{SO}_2(\text{functional hydrocarbyl})$ ,  $-\text{SO}_3(\text{functional hydrocarbyl})$ ,  $-\text{COO}(\text{hydrocarbyl})$ ,  $-\text{COO}(\text{functional hydrocarbyl})$ ,  $-\text{CO}(\text{hydrocarbyl})$ ,  $-\text{CO}(\text{functional hydrocarbyl})$ ,  $-\text{OCO}(\text{hydrocarbyl})$ ,  $-\text{OCO}(\text{functional hydrocarbyl})$ ,  $-\text{CONH}_2$ ,  $-\text{CONH}(\text{hydrocarbyl})$ ,  $-\text{CONH}(\text{functional hydrocarbyl})$ ,  $-\text{CON}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ , or a hydrocarbyl group substituted by any of the above groups;

each  $\text{R}^1$  and  $\text{R}^2$  is identical or different and is independently a hydrocarbyl group of between 1 and 20 carbons, wherein  $\text{R}^1$  and  $\text{R}^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

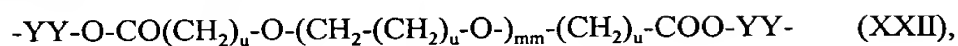
$\text{X}'$  when  $r$  is 2, is selected from the group consisting of  $\text{C}_1\text{-C}_{16}$  alkylene,  $\text{C}_4\text{-C}_{12}$  alkenylene, xylylene,  $\text{C}_4\text{-C}_{20}$  alkylene which is interrupted by one or more oxygen atoms, hydroxy-substituted  $\text{C}_3\text{-C}_{20}$  alkyl which is interrupted by one or more oxygen atoms,  $-\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O}-\text{R}^{15}-\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2-$ ,  $-\text{CO}-\text{R}^{16}-\text{CO}-$ ,  $-\text{CO}-\text{NH}-\text{R}^{17}-\text{NH}-\text{CO}-$ ,  $-(\text{CH}_2)_5-\text{COO}-\text{R}^{18}-\text{OCO}-(\text{CH}_2)_5-$  a polyoxyalkylene bridge member of the formula XX



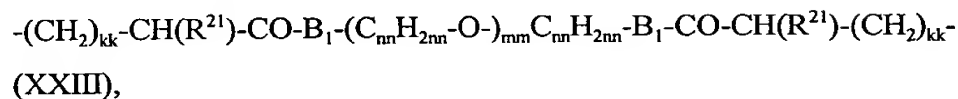
a polyoxyalkylene bridge member of the formula XXI



a polyoxyalkylene bridge member of the formula XXII



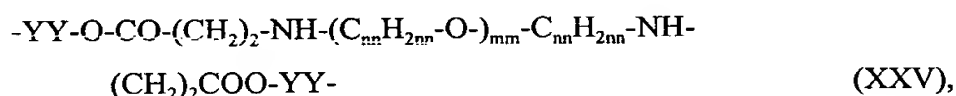
5 a polyoxyalkylene bridge member of the formula XXIII



a polyoxyalkylene bridge member of the formula XXIV



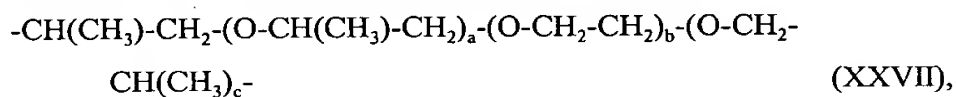
10 a polyoxyalkylene bridge member of the formula XXV



a polyoxyalkylene bridge member of the formula XXVI



15 and a polyoxyalkylene bridge member of the formula XXVII



wherein  $a + c = 2.5$  and  $b = 8.5$  to  $40.5$  or  $a + c = 2$  to  $33$  and  $b = 0$ ,

20  $\text{R}^{15}$  is  $\text{C}_2\text{-C}_{10}$  alkylene,  $\text{C}_2\text{-C}_{10}$  oxaalkylene or  $\text{C}_2\text{-C}_{10}$  dithiaalkylene, phenylene, naphthylene, diphenylene, or  $\text{C}_2\text{-C}_6$  alkenylene, or phenylene-XX-phenylene wherein XX is  $-\text{O}-$ ,  $-\text{S}-$ ,  $-\text{SO}_2-$ ,  $-\text{CH}_2-$ , or  $-\text{C}(\text{CH}_3)_2-$ ;

25  $\text{R}^{16}$  is  $\text{C}_2\text{-C}_{10}$  alkylene,  $\text{C}_2\text{-C}_{10}$  oxaalkylene or  $\text{C}_2\text{-C}_{10}$  dithiaalkylene, phenylene, naphthylene, diphenylene, or  $\text{C}_2\text{-C}_6$  alkenylene provided that when  $r$  is 3 the alkenylene has at least 3 carbons;

$\text{R}^{17}$  is  $\text{C}_2\text{-C}_{10}$  alkylene, phenylene, naphthylene, diphenylene, or  $\text{C}_2\text{-C}_6$  alkenylene, methylenediphenylene, or  $\text{C}_4\text{-C}_{15}$  alkylphenylene; and

30  $\text{R}^{18}$  is  $\text{C}_2\text{-C}_{10}$  alkylene, or  $\text{C}_4\text{-C}_{20}$  alkylene interrupted by one or more oxygen atoms;

$\text{R}^{21}$  is hydrogen or  $\text{C}_1\text{-C}_{16}$  alkyl;

YY is unsubstituted or substituted C<sub>2</sub>-C<sub>20</sub> alkyl;

B<sub>1</sub> is NH or O;

kk is zero or an integer from 1-16;

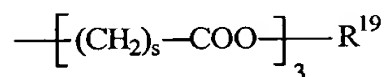
mm is an integer from 2 to 60;

nn is an integer from 2 to 6;

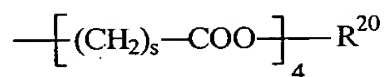
s is 1-6;

u is an integer from 1 to 4;

when r is 3, X' is



and when r is 4, X' is



wherein R<sup>19</sup> is C<sub>3</sub>-C<sub>10</sub> alkanetriyl and R<sup>20</sup> is C<sub>4</sub>-C<sub>10</sub> alkanetetryl.

23. The compound of claim 22, wherein r is 2 and X' is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-, wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other.

24. The compound of claim 23, wherein R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with the nitrogen of an amine.

25. The compound of claim 23, wherein L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of the hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup> or NR<sup>x</sup>R<sup>y</sup>, wherein R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group.

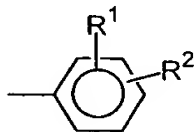
26. The compound of claim 23, wherein  $R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl.

27. The compound of claim 26, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 3 and 4 position relative to the point of attachment of the triazine ring.

28. The compound of claim 26, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 2 and 3 position relative to the point of attachment of the triazine ring.

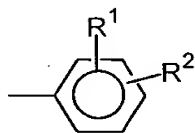
29. The compound of claim 23, wherein each Z is a nitrogen

30. The compound of claim 29, wherein C is



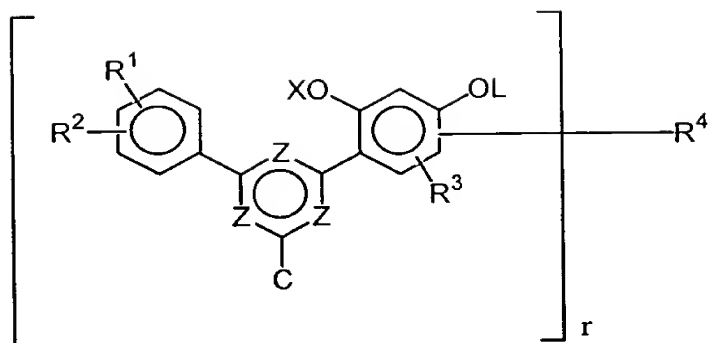
31. The compound of claim 30, wherein each  $R^1$  and  $R^2$  are methyl groups.

32. The compound of claim 23, wherein each Z is nitrogen; X is hydrogen; C is



each  $R_1$  and  $R_2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl; and  $R^3$  and  $R^4$  are each hydrogen.

33. A compound of formula (V):

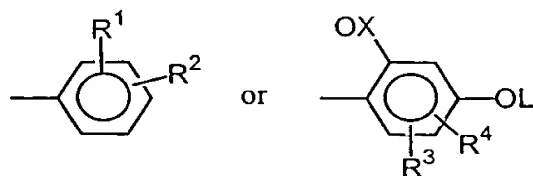


(V)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



5 r is 2;

each of L is independently a

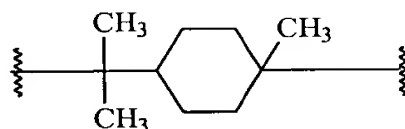
hydrogen, hydrocarbyl,  $-\text{SO}_2(\text{hydrocarbyl})$ ,  $-\text{SO}_3(\text{hydrocarbyl})$ ,  $-\text{SO}_2(\text{functional hydrocarbyl})$ ,  $-\text{SO}_3(\text{functional hydrocarbyl})$ ,  $-\text{COO}(\text{hydrocarbyl})$ ,  $-\text{COO}(\text{functional hydrocarbyl})$ ,  $-\text{CO}(\text{hydrocarbyl})$ ,  $-\text{CO}(\text{functional hydrocarbyl})$ ,  $-\text{OCO}(\text{hydrocarbyl})$ ,  $-\text{OCO}(\text{functional hydrocarbyl})$ ,  $-\text{CONH}_2$ ,  $-\text{CONH}(\text{hydrocarbyl})$ ,  $-\text{CONH}(\text{functional hydrocarbyl})$ ,  $-\text{CON}(\text{hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{hydrocarbyl})$ ,  $-\text{CON}(\text{functional hydrocarbyl})(\text{functional hydrocarbyl})$ , or a hydrocarbyl group substituted by any of the above groups;

15 each of  $\text{R}^3$  is independently a

hydrogen, hydrocarbyl, halogen, hydroxyl, cyano, -O(hydrocarbyl), -O(functional hydrocarbyl), -N(hydrocarbyl)(hydrocarbyl), -N(hydrocarbyl)(functional hydrocarbyl), -N(functional hydrocarbyl)(functional hydrocarbyl), -S(hydrocarbyl), -S(functional hydrocarbyl), -SO<sub>2</sub>(hydrocarbyl), -SO<sub>3</sub>(hydrocarbyl), -SO<sub>2</sub>(functional hydrocarbyl), -SO<sub>3</sub>(functional hydrocarbyl), -COO(hydrocarbyl), -COO(functional hydrocarbyl), -CO(hydrocarbyl), -CO(functional hydrocarbyl), -OCO(hydrocarbyl), -OCO(functional hydrocarbyl), -CONH<sub>2</sub>, -CONH(hydrocarbyl), -CONH(functional hydrocarbyl), -CON(hydrocarbyl)(hydrocarbyl), -CON(functional hydrocarbyl)(hydrocarbyl), -CON(functional hydrocarbyl)(functional hydrocarbyl), or a hydrocarbyl group substituted by any of the above groups;

each R<sup>1</sup> and R<sup>2</sup> is identical or different and is independently a hydrocarbyl group of between 1 and 20 carbons, wherein R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other; and

R<sup>4</sup> is selected from the group consisting of straight chain alkyl of 1 to 12 carbon atoms, branched chain alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkyl substituted by cyclohexyl, alkyl interrupted by cyclohexyl, alkyl substituted by phenylene, alkyl interrupted by phenylene, benzylidene, —S—, —S—S—, —S—E—S—, —SO—, —SO<sub>2</sub>—, —SO—E—SO—, —SO<sub>2</sub>—E—SO<sub>2</sub>—, —CH<sub>2</sub>—NH—E—NH—CH<sub>2</sub>—, and



wherein E is selected from the group consisting of alkyl of 2 to 12 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, alkyl interrupted by cyclohexyl of 8 to 12 carbon atoms, and alkyl terminated by cyclohexyl of 8 to 12 carbon atoms.

25 34. The compound of claim 33, wherein R<sup>4</sup> is -CH<sub>2</sub>-.



35. The compound of claim 33, wherein  $R^3$  is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine.

5 36. The compound of claim 33, wherein L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of the hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$  or  $NR^xR^y$ , wherein  $R^x$  and  $R^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally  
10 may have one or more of the hydrogens substituted for by a hydroxyl group.

37. The compound of claim 33, wherein  $R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl.

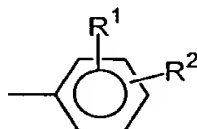
15 38. The compound of claim 37, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 3 and 4 position relative to the point of attachment of the triazine ring.

39. The compound of claim 37, wherein  $R^1$  and  $R^2$  are attached to the aromatic benzene ring at the 2 and 3 position relative to the point of attachment of the triazine ring.

20

40. The compound of claim 33, wherein each Z is a nitrogen

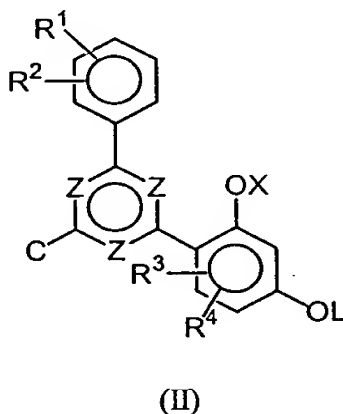
41. The compound of claim 34, wherein each Z is nitrogen; X is hydrogen; C is



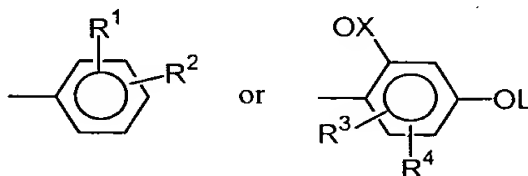
each  $R_1$  and  $R_2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl; and

25  $R^3$  is a hydrogen.

42. A polymeric article comprising at least one polymeric material and a sufficient amount of a stabilizing composition to inhibit at least one of photo or thermal degradation, wherein the stabilizer composition comprises one or more compounds of structure (II) - (V), wherein compound (II) has the structure:



- 5 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;  
 X is independently selected from hydrogen and a blocking group;  
 C is

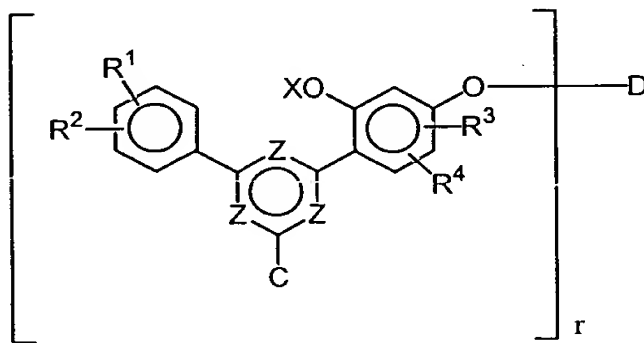


- 10 L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>,  
 15 NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

$R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

each  $R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

compound (III) has the structure:

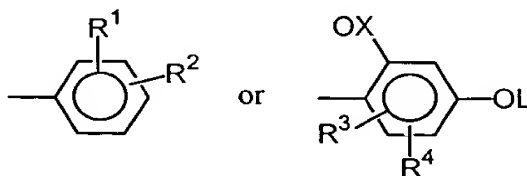


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is

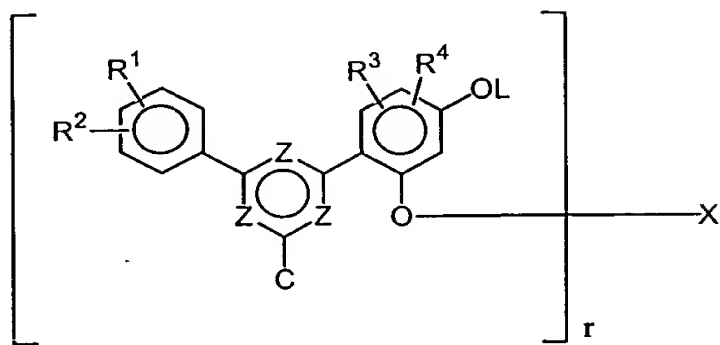


$r$  is 2 and D is an alkyl chain of between 1 and 10 carbons or  $-CO-P-CO-$ , wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;

$R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

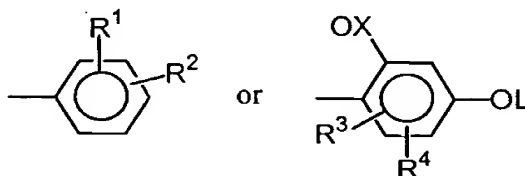
Compound (IV) has the structure:



(IV)

- 5 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

C is

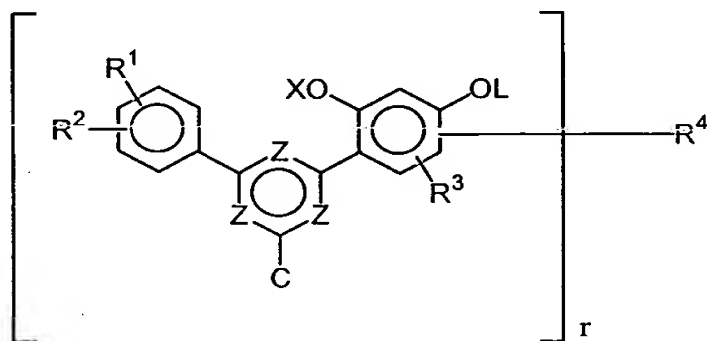


- 10 wherein r is 2 and  $X'$  is an alkyl chain of between 1 and 10 carbons or  $-CO-P-CO-$ , wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;
- $R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;
- 15 L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$ ,  $NR^xR^y$  and  $R^x$  and

$R^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

and compound (V) has the structure:

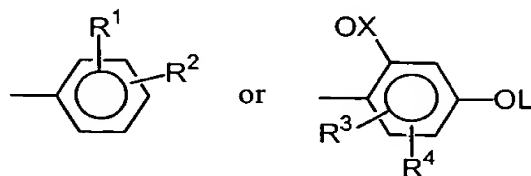


(V)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



$r$  is 2;

$R^4$  is  $-CH_2-$ ;

$R^3$  is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;

L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other.

43. The polymeric article of claim 42, wherein the amount of stabilizer composition is from about 0.01 to about 20 percent by weight of the polymeric material.

44. The polymeric article of claim 42, wherein the polymeric material is selected from the group consisting of polyolefins; polyesters; polyethers; polyketones; polyamides; natural and synthetic rubbers; polyurethanes; polystyrenes; high-impact polystyrenes; polyacrylates; polymethacrylates; polyacetals; polyacrylonitriles; polybutadienes; polystyrenes; ABS; SAN (styrene acrylonitrile); ASA (acrylate styrene acrylonitrile); cellulosic acetate butyrate; cellulosic polymers; polyimides; polyamideimides; polyetherimides; polyphenylsulfides; PPO; polysulfones; polyethersulfones; polyvinylchlorides; polycarbonates; polyketones; aliphatic polyketones; thermoplastic TPO's; aminoresin crosslinked polyacrylates and polyesters; polyisocyanate crosslinked polyesters and polyacrylates; phenol/formaldehyde, urea/formaldehyde, and melamine/formaldehyde resins; drying and non-drying alkyd resins; alkyd resins; polyester resins; acrylate resins cross-linked with melamine resins, urea resins, isocyanates, isocyanurates, carbamates, and epoxy resins; cross-linked epoxy resins derived from aliphatic, cycloaliphatic, heterocyclic and aromatic glycidyl compounds which are cross-linked with anhydrides or amines; polysiloxanes; Michael addition polymers of amines or blocked amines with activated unsaturated and methylene compounds, ketimines with activated unsaturated and methylene compounds, polyketimines in combination with unsaturated acrylic polyacetoacetate resins, and polyketimines in combination with unsaturated acrylic resins;

radiation curable compositions; epoxymelamine resins; organic dyes; cosmetic products; cellulose-based paper formulations; photographic film paper; ink; and blends thereof.

45. The polymeric article of claim 42, wherein the one or more compounds is chemical  
5 bonded to the polymer.

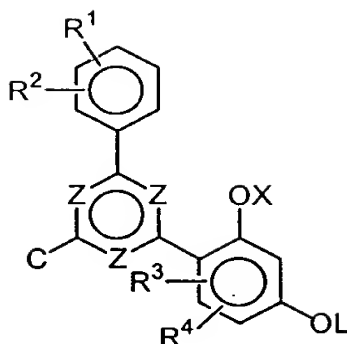
46. The polymeric article of claim 42, wherein the stabilizer composition further comprises one or more hindered amine light stabilizers.

10 47. The polymeric article of claim 42, wherein the stabilizer composition further comprises one or more additional UV light absorbers selected from the group consisting of a benzotriazole, a triazine, a benzophenone, and mixtures thereof.

48. The polymeric article of claim 42, wherein the stabilizer composition further comprises  
15 at least one additional additive.

49. The polymeric article of claim 48, wherein the additive is selected from the group consisting of: antioxidants, ultraviolet light absorbers, ultraviolet light stabilizers, metal deactivators, phosphites, phosphonites, hydroxylamines, nitrones, thiosynergists, peroxide  
20 scavengers, polyamide stabilizers, nucleating agents, fillers, reinforcing agents, plasticizers, lubricants, emulsifiers, pigments, rheological additives, flameproofing agents, antistatic agents, blowing agents, benzofuranones and indolinones.

50. A multilayer polymeric article comprising a polymeric article having at least one surface  
25 and a thin film of polymer composition applied to the at least one surface that comprises a sufficient amount of at least one compound of formula (II) - (V) to inhibit at least one of photo or thermal degradation, wherein compound (II) has the structure:

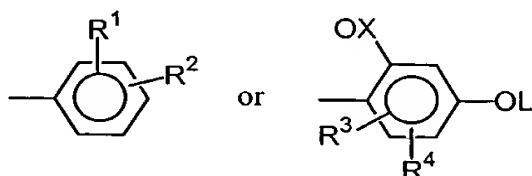


(II)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

5 C is

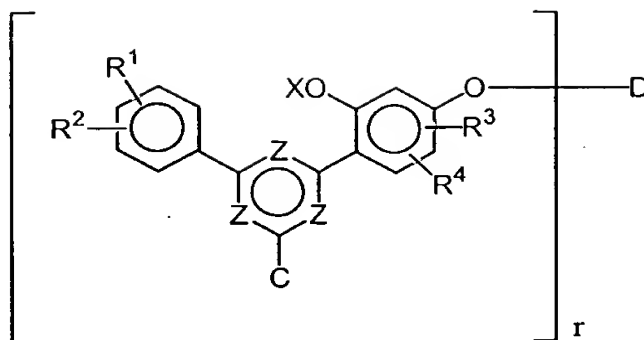


L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

10 R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and  
15 each R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

compound (III) has the structure:



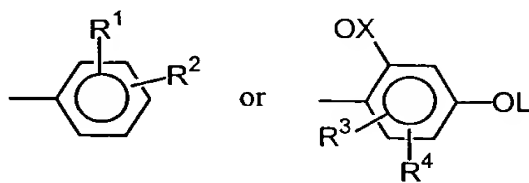


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



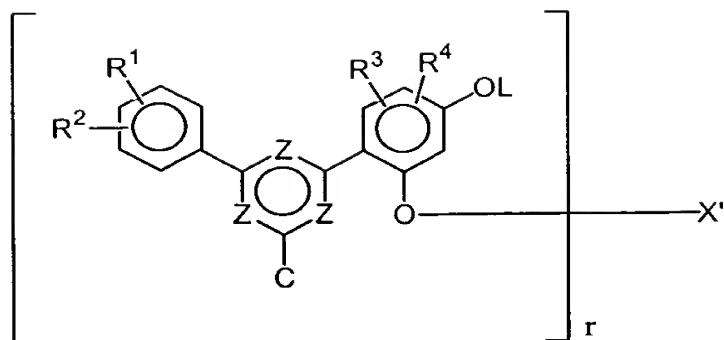
5      r is 2 and D is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-, wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be

10      substituted with an the nitrogen of an amine; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

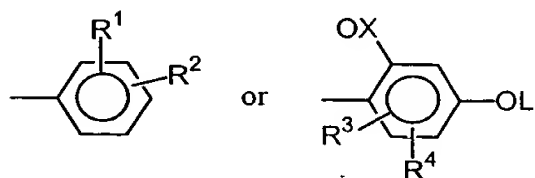
compound (IV) has the structure:



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

C is



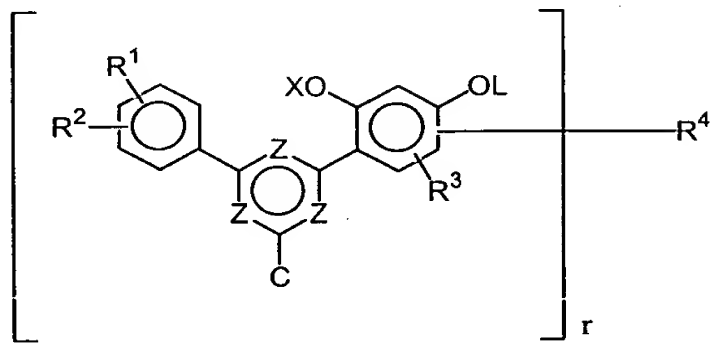
wherein r is 2 and X' is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-,  
 wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein  
 the carbonyl groups are meta or para to each other;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms  
 wherein one or more of the hydrogens in the alkyl chain may optionally be  
 substituted with an the nitrogen of an amine;

L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
 interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
 alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
 functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and  
 R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that  
 optionally may have one or more of the hydrogens substituted for by a hydroxyl  
 group;

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

and compound (V) has the structure:

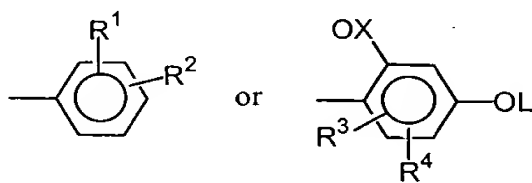


(V)

5 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



r is 2;

10  $R^4$  is  $-CH_2-$ ;

$R^3$  is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;

15 L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$ ,  $NR^xR^y$  and  $R^x$  and

R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group; and

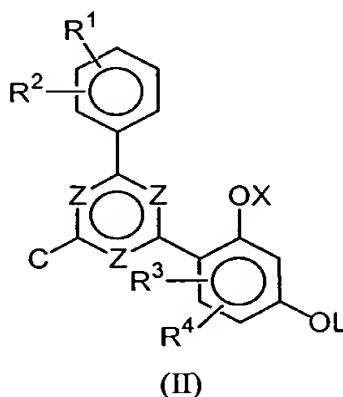
R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other.

51. The multilayer polymeric article of claim 50, wherein the thin film is applied to each surface of the polymeric article.

52. The multilayer polymeric article of claim 50, wherein the amount of the compound is from about 0.1 to 20 percent by weight of the thin film.

53. The multilayer polymeric article of claim 50, wherein the thin film is from about 5 to 500 μm in thickness.

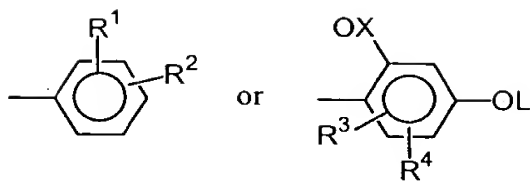
54. A coating comprising a sufficient amount of at least one compound of formula (II) - (V) to inhibit at least one of photo or thermal degradation, wherein compound (II) has the structure:



wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is

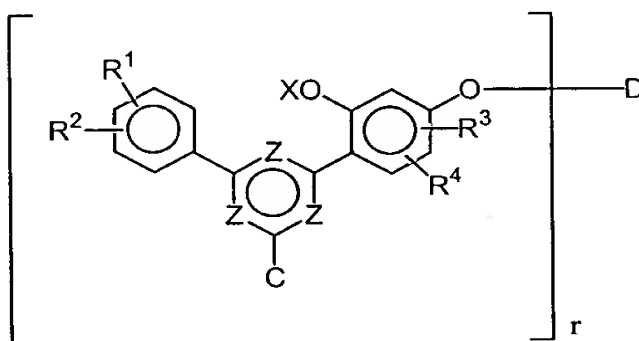


L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

each R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

compound (III) has the structure:

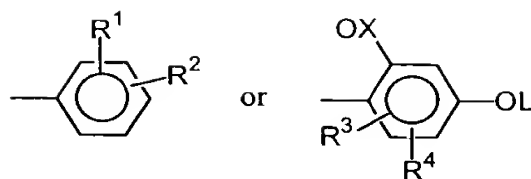


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



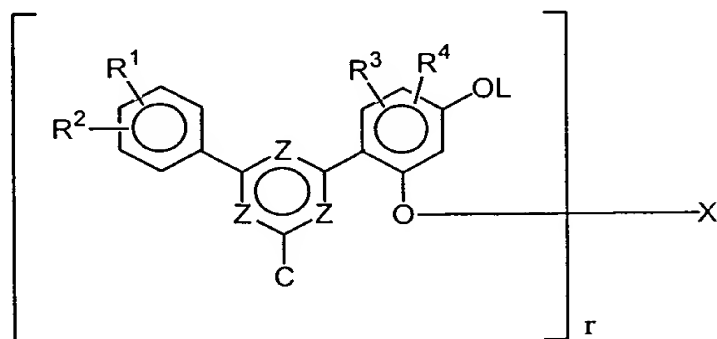
r is 2 and D is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-, wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the

5 carbonyl groups are meta or para to each other;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

10 R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

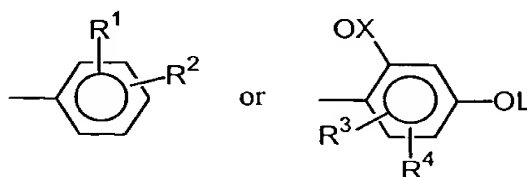
compound (IV) has the structure:



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

15 C is



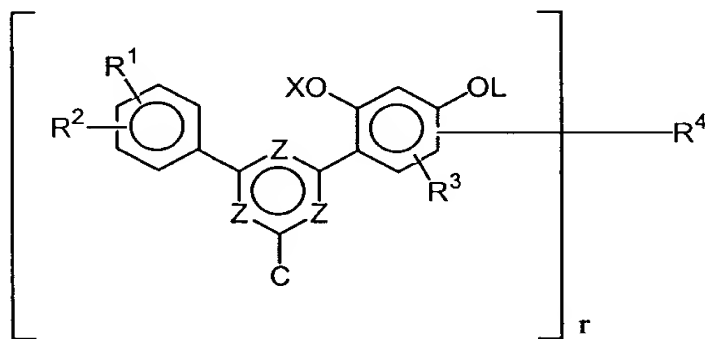
wherein  $r$  is 2 and  $X'$  is an alkyl chain of between 1 and 10 carbons or  $-\text{CO}-\text{P}-\text{CO}-$ ,  
wherein  $\text{P}$  is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein  
the carbonyl groups are meta or para to each other;

$\text{R}^3$  and  $\text{R}^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms  
5 wherein one or more of the hydrogens in the alkyl chain may optionally be  
substituted with an the nitrogen of an amine;

$\text{L}$  is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
10 functionality of general structure  $-\text{CO}-\text{M}$ , wherein  $\text{M}$  is a  $\text{OR}^x$ ,  $\text{NR}^x\text{R}^y$  and  $\text{R}^x$  and  
 $\text{R}^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that  
optionally may have one or more of the hydrogens substituted for by a hydroxyl  
group;

$\text{R}^1$  and  $\text{R}^2$  is individually a  $\text{C}_1$  to  $\text{C}_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl  
15 and  $\text{R}^1$  and  $\text{R}^2$  are attached to an aromatic benzene ring so that they are ortho to  
each other;

and compound (V) has the structure:

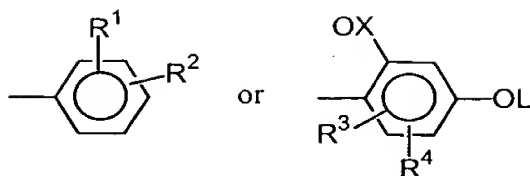


(V)

wherein each  $\text{Z}$  is independently nitrogen or methine, and at least two  $\text{Z}$  are nitrogen, to  
form a triazine or pyrimidine ring;

20  $\text{X}$  is independently selected from hydrogen and a blocking group;

$\text{C}$  is



r is 2;

R<sup>4</sup> is -CH<sub>2</sub>-;

R<sup>3</sup> is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more  
 5 of the hydrogens in the alkyl chain may optionally be substituted with an the  
 nitrogen of an amine;

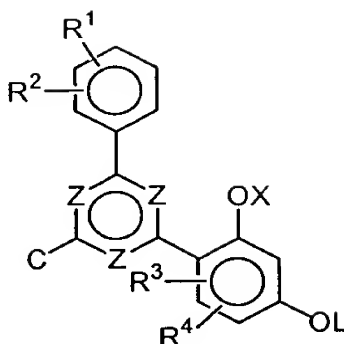
L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
 interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
 alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
 10 functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and  
 R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that  
 optionally may have one or more of the hydrogens substituted for by a hydroxyl  
 group; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl  
 15 and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to  
 each other.

55. The coating of claim 54, wherein the amount of the at least one compound is from about  
 0.01 to 20 percent by weight of the coating.

20 56. A concentrate comprising a polymeric resin and from about 2.5 to about 25 percent of at  
 least one compound of formula (II) - (V), wherein compound (II) has the structure:



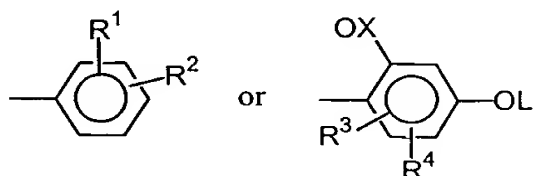


(II)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

5 C is



L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is

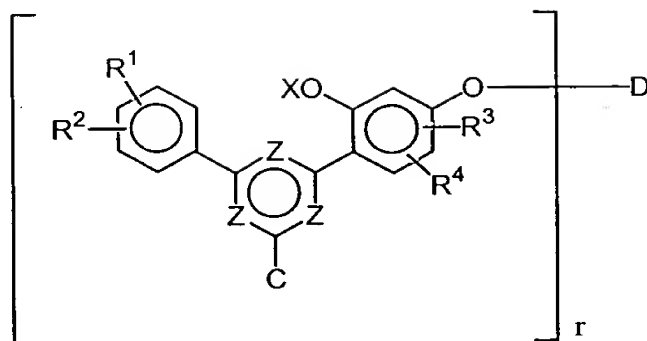
optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms

15 wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

each R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

compound (III) has the structure:

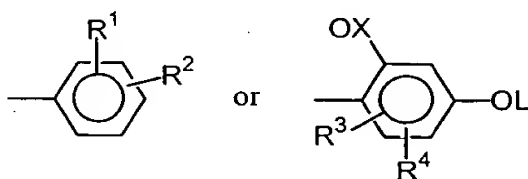


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

5 C is

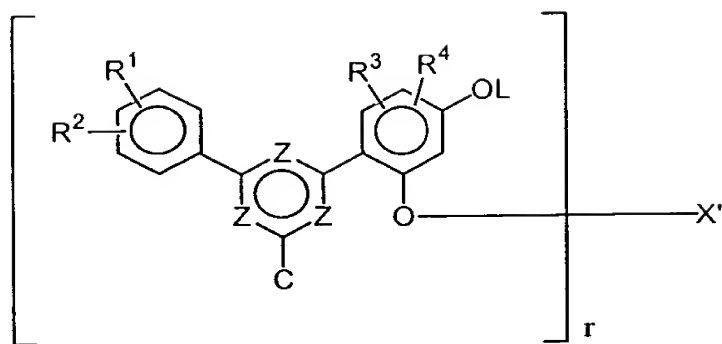


r is 2 and D is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-, wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;

10 R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

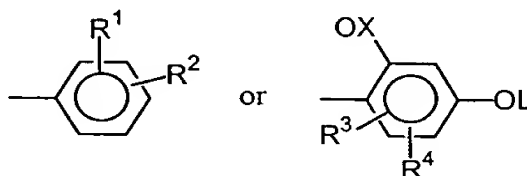
15 compound (IV) has the structure:



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

C is



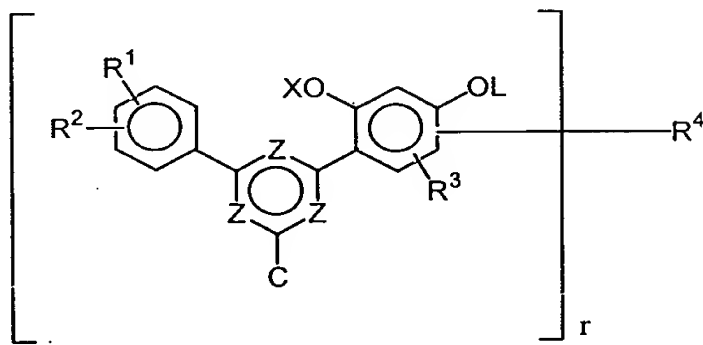
wherein r is 2 and X' is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-,  
 wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein  
 the carbonyl groups are meta or para to each other;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms  
 wherein one or more of the hydrogens in the alkyl chain may optionally be  
 substituted with an the nitrogen of an amine;

L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
 interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
 alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
 functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and  
 R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that  
 optionally may have one or more of the hydrogens substituted for by a hydroxyl  
 group;

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl  
and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to  
each other;

and compound (V) has the structure:

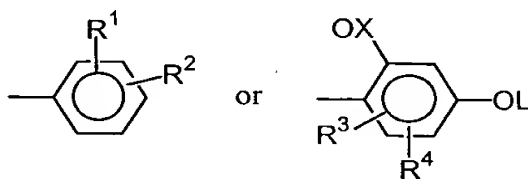


(V)

5 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to  
form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



r is 2;

10  $R^4$  is  $-CH_2-$ ;

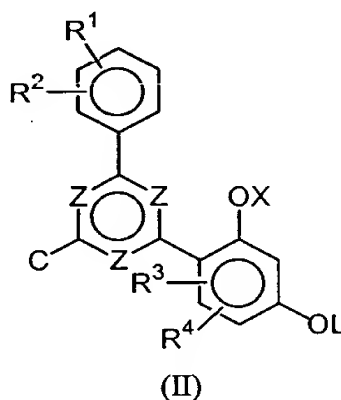
$R^3$  is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more  
of the hydrogens in the alkyl chain may optionally be substituted with an the  
nitrogen of an amine;

15 L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$ ,  $NR^xR^y$  and  $R^x$  and

$R^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group; and

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other.

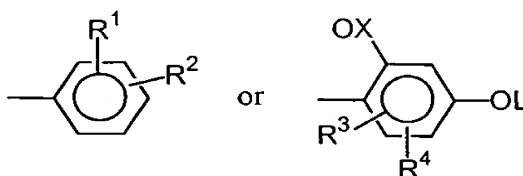
57. A cosmetic composition comprising a sufficient amount of at least one compound of formula (II) - (V), wherein compound (II) has the structure:



wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $-CO-M$ , wherein M is a  $OR^x$ ,  $NR^xR^y$  and  $R^x$  and  $R^y$  are independently hydrogen or an alkyl group of between

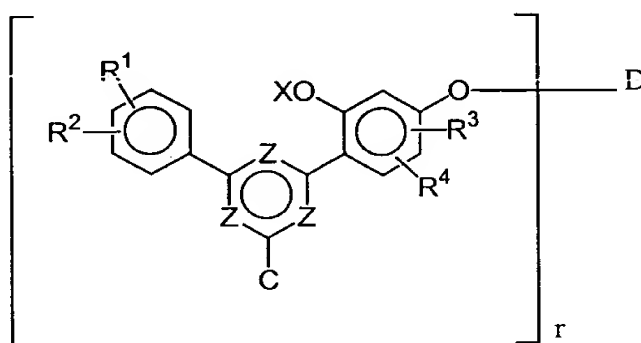
1 and 8 carbons that optionally may have one or more of the hydrogens substituted  
for by a hydroxyl group;

$R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms  
wherein one or more of the hydrogens in the alkyl chain may optionally be

5 substituted with an the nitrogen of an amine; and

each  $R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or  
cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are  
ortho to each other;

compound (III) has the structure:

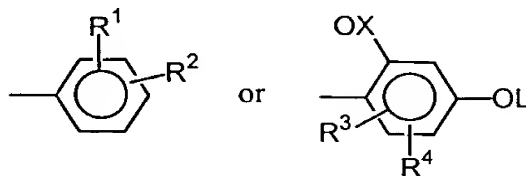


(III)

10 wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to  
form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is

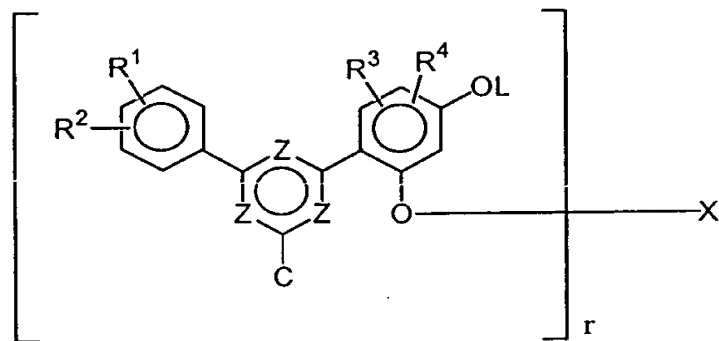


$r$  is 2 and D is an alkyl chain of between 1 and 10 carbons or  $-CO-P-CO-$ , wherein P is  
15 an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the  
carbonyl groups are meta or para to each other;

$R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

$R^1$  and  $R^2$  is individually a  $C_1$  to  $C_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $R^1$  and  $R^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

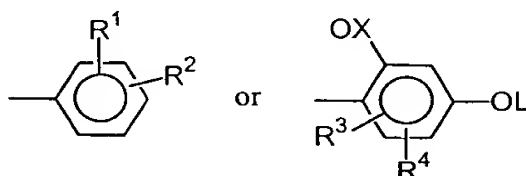
compound (IV) has the structure:



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

C is



wherein r is 2 and  $X'$  is an alkyl chain of between 1 and 10 carbons or  $-CO-P-CO-$ , wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;

$R^3$  and  $R^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;

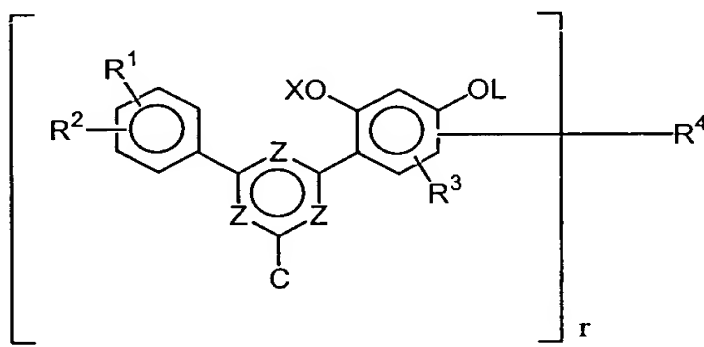
L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the

alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure  $\text{-CO-M}$ , wherein M is a  $\text{OR}^x$ ,  $\text{NR}^x\text{R}^y$  and  $\text{R}^x$  and  $\text{R}^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

5

$\text{R}^1$  and  $\text{R}^2$  is individually a  $\text{C}_1$  to  $\text{C}_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl and  $\text{R}^1$  and  $\text{R}^2$  are attached to an aromatic benzene ring so that they are ortho to each other;

and compound (V) has the structure:



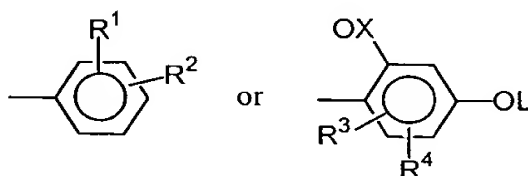
(V)

10

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



r is 2;

15

$\text{R}^4$  is  $\text{-CH}_2\text{-}$ ;

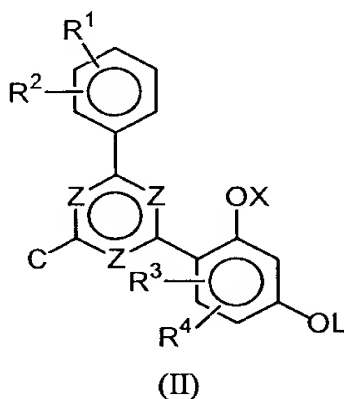


R<sup>3</sup> is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;

L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other.

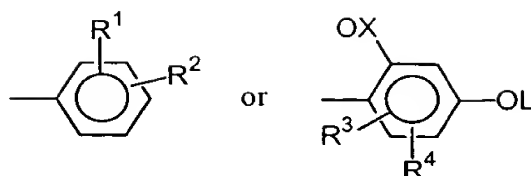
58. A method of stabilizing a material that is subject to at least one of photo or thermal degradation by incorporating into or onto the material an amount of one or more stabilizer compositions in an amount effective to stabilize the material against at least one of photo or thermal degradation, wherein the stabilizer composition comprises one or more compounds of structure (II) - (V), wherein compound (II) has the structure:



wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is

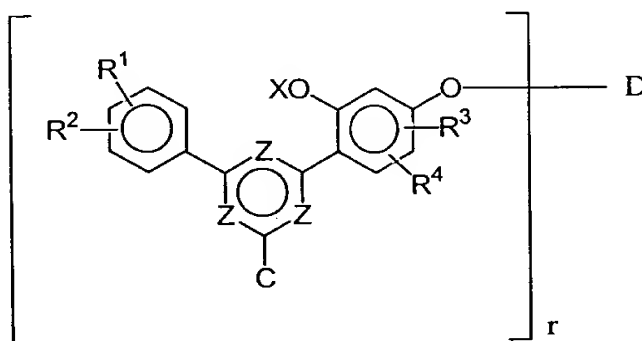


L is an alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group;

R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

each R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

15 compound (III) has the structure:

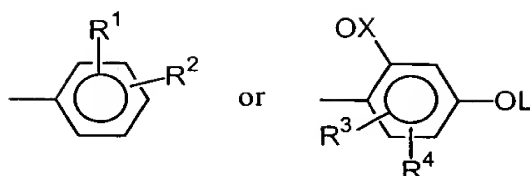


(III)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

X is independently selected from hydrogen and a blocking group;

C is



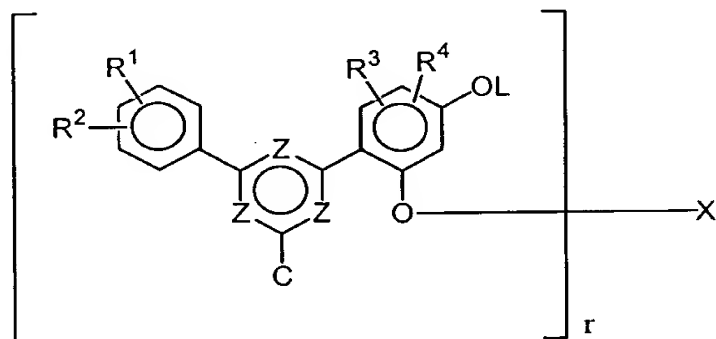
r is 2 and D is an alkyl chain of between 1 and 10 carbons or -CO-P-CO-, wherein P is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein the carbonyl groups are meta or para to each other;

5 R<sup>3</sup> and R<sup>4</sup> is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other;

10

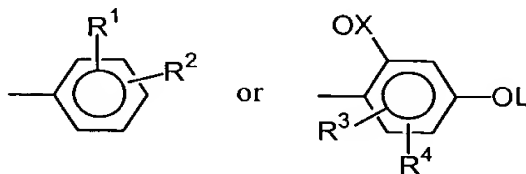
compound (IV) has the structure:



(IV)

wherein each Z is independently nitrogen or methine, and at least two Z are nitrogen, to form a triazine or pyrimidine ring;

C is



15

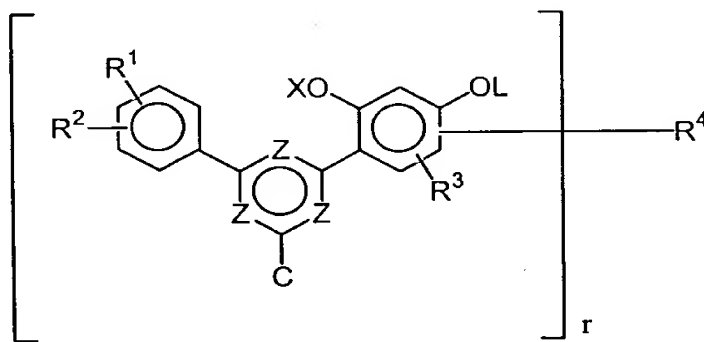
wherein  $r$  is 2 and  $X'$  is an alkyl chain of between 1 and 10 carbons or  $-\text{CO}-\text{P}-\text{CO}-$ ,  
 wherein  $\text{P}$  is an alkyl chain of between 1 and 10 carbons or a benzene ring wherein  
 the carbonyl groups are meta or para to each other;

$\text{R}^3$  and  $\text{R}^4$  is independently selected from hydrogen, and an alkyl of 1 to 8 carbons atoms  
 5 wherein one or more of the hydrogens in the alkyl chain may optionally be  
 substituted with an the nitrogen of an amine;

$\text{L}$  is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally  
 interrupted by one or more oxygen atoms, has one or more of hydrogens in the  
 alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl  
 10 functionality of general structure  $-\text{CO}-\text{M}$ , wherein  $\text{M}$  is a  $\text{OR}^x$ ,  $\text{NR}^x\text{R}^y$  and  $\text{R}^x$  and  
 $\text{R}^y$  are independently hydrogen or an alkyl group of between 1 and 8 carbons that  
 optionally may have one or more of the hydrogens substituted for by a hydroxyl  
 group;

$\text{R}^1$  and  $\text{R}^2$  is individually a  $\text{C}_1$  to  $\text{C}_{10}$  straight chain alkyl, branched alkyl, or cycloalkyl  
 15 and  $\text{R}^1$  and  $\text{R}^2$  are attached to an aromatic benzene ring so that they are ortho to  
 each other;

and compound (V) has the structure:

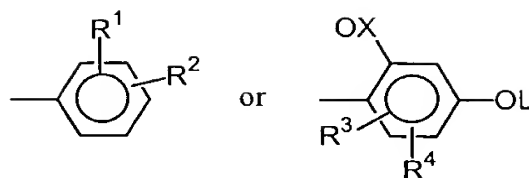


(V)

wherein each  $\text{Z}$  is independently nitrogen or methine, and at least two  $\text{Z}$  are nitrogen, to  
 form a triazine or pyrimidine ring;

20  $\text{X}$  is independently selected from hydrogen and a blocking group;

$\text{C}$  is



r is 2;

R<sup>4</sup> is -CH<sub>2</sub>-;

R<sup>3</sup> is selected from hydrogen, and an alkyl of 1 to 8 carbons atoms wherein one or more of the hydrogens in the alkyl chain may optionally be substituted with an the nitrogen of an amine;

L is alkyl chain of between 1 and 20 carbons, wherein the alkyl chain is optionally interrupted by one or more oxygen atoms, has one or more of hydrogens in the alkyl chain substituted for by a hydroxyl group, or terminates with a carbonyl functionality of general structure -CO-M, wherein M is a OR<sup>x</sup>, NR<sup>x</sup>R<sup>y</sup> and R<sup>x</sup> and R<sup>y</sup> are independently hydrogen or an alkyl group of between 1 and 8 carbons that optionally may have one or more of the hydrogens substituted for by a hydroxyl group; and

R<sup>1</sup> and R<sup>2</sup> is individually a C<sub>1</sub> to C<sub>10</sub> straight chain alkyl, branched alkyl, or cycloalkyl and R<sup>1</sup> and R<sup>2</sup> are attached to an aromatic benzene ring so that they are ortho to each other.

59. The method of claim 58, wherein the stabilizer composition is incorporated in an amount of from about 0.01 to about 20 percent by weight of the material to be stabilized.

60. The method of claim 58, wherein the material to be stabilized is polymeric.

61. The method of claim 60, wherein the polymeric material is selected from the group consisting of polyolefins; polyesters; polyethers; polyketones; polyamides; natural and synthetic rubbers; polyurethanes; polystyrenes; high-impact polystyrenes; polyacrylates; polymethacrylates; polyacetals; polyacrylonitriles; polybutadienes; polystyrenes; ABS; SAN (styrene acrylonitrile); ASA (acrylate styrene acrylonitrile); cellulosic acetate butyrate; cellulosic polymers; polyimides; polyamideimides; polyetherimides; polyphenylsulfides; PPO;

polysulfones; polyethersulfones; polyvinylchlorides; polycarbonates; polyketones; aliphatic polyketones; thermoplastic TPO's; aminoresin crosslinked polyacrylates and polyesters; polyisocyanate crosslinked polyesters and polyacrylates; phenol/formaldehyde, urea/formaldehyde, and melamine/formaldehyde resins; drying and non-drying alkyd resins; 5 alkyd resins; polyester resins; acrylate resins cross-linked with melamine resins, urea resins, isocyanates, isocyanurates, carbamates, and epoxy resins; cross-linked epoxy resins derived from aliphatic, cycloaliphatic, heterocyclic and aromatic glycidyl compounds which are cross-linked with anhydrides or amines; polysiloxanes; Michael addition polymers of amines or blocked amines with activated unsaturated and methylene compounds, ketimines with activated 10 unsaturated and methylene compounds, polyketimines in combination with unsaturated acrylic polyacetoacetate resins, and polyketimines in combination with unsaturated acrylic resins; radiation curable compositions; epoxymelamine resins; organic dyes; cosmetic products; cellulose-based paper formulations; photographic film paper; ink; and blends thereof.

15 62. The method of claim 58, wherein the one or more compounds is incorporated into the polymer by chemical bonding during and/or subsequent to the preparation of the polymer.

63. The method of claim 58, wherein the material has one or more surfaces and the stabilizer composition is applied to at least one surface of the material.

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64. The method of claim 63, wherein the stabilizer composition is part of a coating that is applied to the at least one surface of the material

65. The method of claim 63, wherein the material is metallic, wood, ceramic, polymeric, or 25 a fiber material.

66. The method of claim 58, further comprising chemically bonding the one or more compounds to the material.

30 67. The method of claim 66, further comprising forming the material into a fiber.